Notice No. 2

Rules and Regulations for the Construction and Classification of Ships for the Carriage of Liquefied Gases in Bulk, July 2019

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Please note that corrigenda amends to paragraphs, Tables and Figures are not shown in their entirety.

Issue date: June 2020

Amendments to	Effective date	IACS/IMO implementation (if applicable)
Chapter 4, Part D	1 July 2020	1 July 2020
Chapter 6, Section 6.5	1 July 2020	1 July 2020
Chapter 6, Section 6.6	1 July 2020	N/A

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Chapter 4
Cargo Containment

Part D - Materials and Construction

4.19 Materials

4.19.1 ***Materials forming ship structure***

LR 4.19-05 Details of proposed systems for the means of heating structural members to ensure that the material temperature does not fall below the minimum temperature allowed for the grade of material specified in Table 6.5 are to be submitted. The level of heating system redundancy required by 4.19.1.6 is to be demonstrated through compliance with the following:

> .1 The heating system referred to in 4.19.1.6.1 is to be such that, in case of a single failure of a mechanical or electrical component in any part of the system, heating can be maintained at not less than 100 per cent of the theoretical heat requirement.
>
> .2 Where the above requirements are met by duplication of the system components, i.e. heaters, glycol circulation pumps, electrical control panel, auxiliary boilers, etc., all electrical components of at least one of the systems are to be supplied from the emergency ~~switch board~~ source of electrical power.
>
> .3 Where duplication of the primary source of heat, e.g. oil-fired boiler, is not feasible, alternative proposals can be accepted such as an electric heater capable of providing 100 per cent of the theoretical heat requirement is to be provided and is to be supplied by an independent circuit arranged separately on the emergency switchboard. Other solutions may be considered acceptable towards satisfying the requirements specified in 4.19.1.6.1, provided that a suitable risk assessment is conducted to the satisfaction of the Administration. The requirement in paragraph LR 4.19-05 .2 continues to apply to all other electrical components in the system.

4.20 Construction processes

(Part only shown)

4.20.1.1 All welded joints of the shells of independent tanks shall be of the in-plane butt weld full penetration type. For dome-to-shell connections only, tee welds of the full penetration type may be used depending on the results of the tests carried out at the approval of the welding procedure. Except for small penetrations on domes, nozzle welds shall also be designed with full penetration.

LR 4.20-05 Regulation 4.20.1.1 is applicable to independent tanks of type A or type B, primarily constructed of plane surfaces. This includes the tank corners, which are constructed using bent plating aligned with the tank surfaces and connected with in-plane welds.

LR 4.20-06 In the context of regulation 4.20.1.1, the applicability of the expression ‘For dome-to-shell connections only’ is clarified as follows:

- Welded corners (i.e. corners made of weld metal) shall not be used in the main tank shell construction, i.e. corners between the shell side (sloped plane surfaces parallel to hopper or top side inclusive, if any) and bottom or top of the tank, and between the tank end transverse bulkheads and the bottom, top or shell sides (sloped plane surfaces inclusive, if any) of the tank. Instead, tank corners which are constructed using bent plating aligned with the tank surfaces and connected with in-plane welds, are to be used.
- Tee welds can be accepted for other localised constructions of the shell such as suction well, sump, dome, etc. where tee welds of full penetration type shall also be used.

4.20.1.2 Welding joint details for type C independent tanks, and for the liquid-tight primary barriers of type B independent tanks primarily constructed of curved surfaces, shall be as follows:

> .1 all longitudinal and circumferential joints shall be of butt welded, full penetration, double vee or single vee type. Full penetration butt welds shall be obtained by double welding or by the use of backing rings. If used, backing rings shall be removed except from very small process pressure vessels. Other edge preparations may be permitted, depending on the results of the tests carried out at the approval of the welding procedure; and
>
> .2 the bevel preparation of the joints between the tank body and domes and between domes and relevant fittings shall be designed according to a standard acceptable to the Administration or recognized organization acting on its behalf. All welds connecting nozzles, domes or other penetrations of the vessel and all welds connecting flanges to the vessel or nozzles shall be full penetration welds.

LR 4.20-07 In the context of regulation 4.20.1.2, the applicability of the expression ‘Other edge preparations’ is clarified as follows:

- Cruciform full penetration welded joints in a bi-lobe tank with centreline bulkhead can be accepted for the tank structure construction at tank centreline welds with bevel preparation subject to the approval of LR, based on the results of the tests carried out at the approval of the welding procedure (*see Figure LR 4.1 Cruciform full penetration weld*).

*Existing **LR 4.20-05** to be renumbered **LR 4.20-08**.*

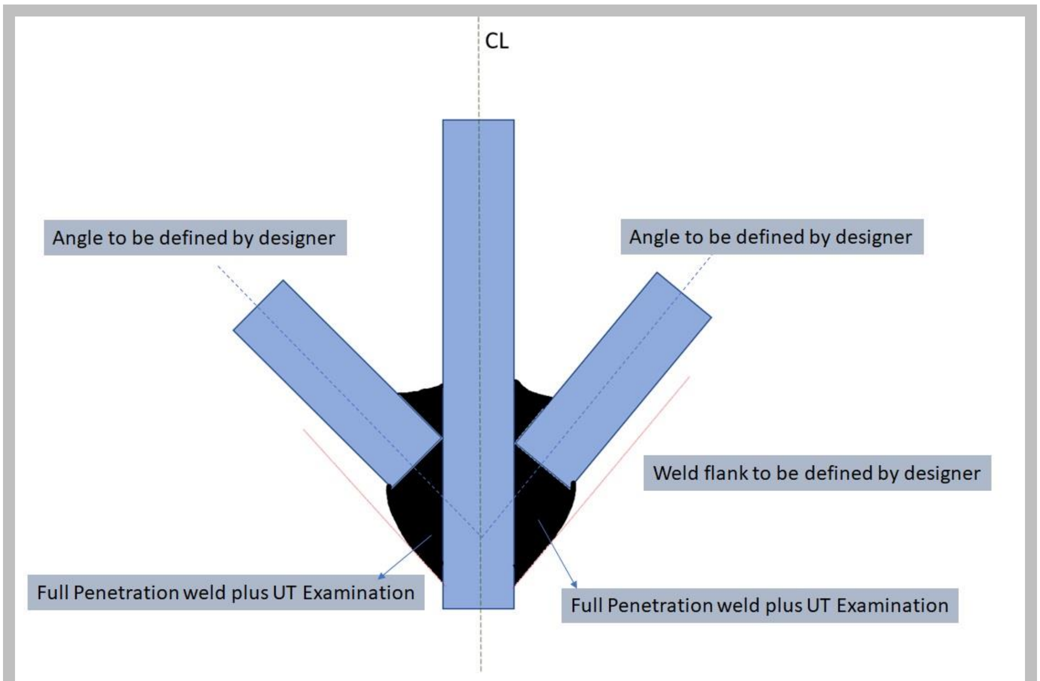
CL
Angle to be defined by designer
Angle to be defined by designer
Weld flank to be defined by designer
Full Penetration weld plus UT Examination
Full Penetration weld plus UT Examination

Figure LR 4.1 Cruciform full penetration weld

Chapter 6

Materials of Construction and Quality Control

Section 6.5 Welding of metallic materials and non-destructive testing

LR 6.5-15 Non-destructive ~~testing~~ examination (NDE) ~~(or non-destructive examination (NDE))~~ is to meet the requirements of Chapter 13, 4 of the Rules for Materials for Class 1 pressure vessels.

LR 6.5-16 General NDE requirements shall be in accordance with the *Rules for the Manufacture, Testing and Certification of Materials, July 2019*, *Ch 1, 5 Non-destructive examination,* and suppliers of NDE services (e.g. NDE firms or internal shipyard NDE department) shall comply with *Rules for the Manufacture, Testing and Certification of Materials, July 2019*, *Ch 1, 5.3 Requirements for suppliers of NDE services.*

Section 6.6 Other requirements for construction in metallic materials

~~**LR 6.5-16**~~ **LR 6.6.01** Manufacture and workmanship are to satisfy the requirements of ~~Ch 13,4 of the Rules for Materials for Class 1 pressure vessels~~*Rules for the Manufacture, Testing and Certification of Materials, July 2019*, *Ch 13,4 Specific requirements for fusion welded pressure vessels.*

~~**LR 6.5-17**~~ **LR 6.6.02** For Type C independent tanks other than the above, the post-weld heat treatment is to conform to the requirements of ~~Ch 13,4.10 and 4.11 in the Rules for Materials~~*Rules for the Manufacture, Testing and Certification of Materials, July 2019*, *Ch 13, 4.10 Post-weld heat treatment* and *Ch 13, 4.11 Basic requirements for post-weld heat treatment of fusion welded pressure vessels*. For all carbon and carbon-manganese steel tanks requiring heat treatment, the requirements of ~~Table 13.4.2 in the Rules for Materials the Rules for Materials~~*Rules for the Manufacture, Testing and Certification of Materials, July 2019*, *Ch 13, 4.10 Post-weld heat treatment, Table 13.4.2 Post-weld heat treatment requirements* are to be complied with.

~~**LR 6.5-18**~~ **LR 6.6.03** The post-weld~~ing~~ heat treatment requirements contained within ~~of Ch 13, 4.10 and 4.11 in the Rules for Materials~~ *Rules for the Manufacture, Testing and Certification of Materials, July 2019*, *Ch 13, 4.10 Post-weld heat treatment* and *Ch 13, 4.11 Basic requirements for post-weld heat treatment of fusion welded pressure vessels* are to be complied with where applicable.

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